

Abstract

A method is provided of forming a silicon-on-insulator (SOI) substrate having at least two exposed surface crystal orientations. The method begins by providing an SOI substrate having a first silicon layer with a surface having a first crystal orientation located on a first buried oxide layer. The buried oxide layer is located on a silicon substrate having a surface with a second crystal orientation. The first silicon layer and the first buried oxide layer are selectively removed from a first portion of the SOI substrate to expose a first surface portion of the silicon substrate. A second silicon layer is epitaxially grown over the first surface portion of the silicon substrate. The second silicon layer has a surface with a second crystal orientation. A second buried oxide layer is formed in the second silicon layer. Subsequent to the fabrication of the SOI substrate, N and P type MOSFETS may be formed on the surfaces with different crystal orientations.